

Implementation of Family Psychoeducation on Foot Care Ability in Diabetic Neuropathy Patients in Palu City, Indonesia

Ismawati^{1*}, Nur Anisah², Ricky Riyanto Iksan³, Iin Ruliana Rohenti⁴, Yusrini⁵, Titik Setiyaningrum⁶, Imam Subiyanto⁷, Jeni Rante Tasik⁸, Adolfina Tandilangan⁹, Susiana Jansen¹⁰

Department of Nursing, University of Muhammadiyah Manado, Indonesia¹

Department of Nursing, High School of Health Science Wira Husada Yogyakarta, Indonesia²

Department of Nursing, High School of Health Science Tarumanagara Jakarta, Indonesia³

Department of Nursing, High School of Health Science Bani Saleh Jakarta, Indonesia^{4,5}

Department of Nursing, High School of Health Science RSPAD Gatot Soebroto, Indonesia^{6,7}

Department of Nursing, POLTEKKES of Timika, Indonesia^{8,9}

Department of Nursing, University of Pembangunan Nasional Veteran Jakarta, Indonesia¹⁰

Corresponding Author: 1*



Keywords:

Family Psychoeducation, Foot Care, Diabetic Neuropathy

ABSTRACT

Effectiveness of family psychoeducational therapy on increasing family abilities in foot care in diabetic neuropathy patients in the Palu City area. The design used in this study used the Pre-Experimental One Group Pretest-Posttest design. The population in this study were DM patients who visited the Kawatuna Health Center in Palu City from June to September 2021, with a total sample of 30 people obtained based on a purposive sampling technique. The analysis of this study using The Paired Samples Test was carried out with the help of computer software with the application of the SPSS statistical program. The results of this study indicate that after treatment for one month, the effectiveness showed changes in the second week of the foot care intervention with the mean respondent (64.24) and a decrease in the degree of diabetic neuropathy in the intervention group. Respondents stated that they experienced an increase in foot sensation with the result that 56.7% of respondents stated mild neuropathy, and as many as 40% experienced moderate degree of neuropathy. The majority of respondents were in the age group > 65 years, namely 36.7%, with a distribution based on the length of time they had DM, namely 5-7 years. The results of the study statistically showed that the family's ability to care for the feet of the respondents had a fairly strong correlation (0.594). Implementation of family psychoeducation for respondents was effective in helping respondents obtain appropriate information in dealing with physical conditions related to chronic illness experienced by 56.7% of respondents.



This work is licensed under a Creative Commons Attribution Non-Commercial 4.0 International License.

1. Introduction

Diabetes mellitus (DM) is one of the biggest global public health problems, although its incidence has begun to decrease in several countries, the prevalence of diabetes has increased in the last few decades in most developed and developing countries [1], [2]. The World Health Organization (WHO) estimates that there will be an increase in DM cases in all countries of the world as many as 463 million people [1]. The American Diabetes Association states that diabetes mellitus is a chronic disease with a high prevalence and causes acute and chronic complications [3].

The high prevalence worldwide causes an increase in DM cases in Southeast Asia to be higher than in other countries including Indonesia [1]. In Indonesia, the high prevalence is caused by heredity, which is dominated by ages 20-59 years [4], [5]. The International Diabetes Federation (IDF) states that the diabetes epidemic is showing an increase in Indonesia, which is included in the seven countries with the largest number of DM cases which have contributed to the increase in the prevalence of DM cases in Southeast Asia with a total of 10.7 million cases [4], [6].

Central Sulawesi ranks 10th in the province with the most DM cases in Indonesia [5]. Data from the Central Sulawesi Provincial Health Office report that Palu City is one of the areas with the second highest prevalence of cases. In 2015 there were 16,456 cases of DM and it continues to increase every year until 2021 when 26,204 cases of DM were reported [6]. One of the areas with a high prevalence of diabetes mellitus cases in Palu City, namely the Kawatuna Health Center has recorded an increase in cases over the last 5 years by 40.4%, 2022 there will be 470 patients with a medical diagnosis of diabetes mellitus [7].

The urgency in the Palu City area with DM cases which continues to increase every year is an indicator of low health program performance achievements due to the low self-awareness of DM sufferers to carry out examinations and treatment independently [5], [7]. The lack of public understanding of health management, as well as the lack of community compliance in managing therapy and early detection of increased blood sugar, and the lack of public awareness and knowledge about self-care have led to an increase in DM cases in the Palu City area every year [7].

Health management related to DM control in the community has so far not been maximized, this shows that diabetes education provided so far in health services is still ineffective [5]. Psychological problems in DM patients have a major influence on the lives of individuals with diabetes, their families, and the health care system. Psychoeducational therapy for families is an element of the health care program by providing information and education through therapeutic communication to families [6], [8]. According to the National Alliance for the Mental Illness family, psychoeducation refers to programs that provide education, support, and guidance to families. Family psychoeducation is a family nursing practice using educational approaches and practices that are effective in reducing symptoms of anxiety, and pain can increase the survival of respondents [8]. The results of other studies show that psychoeducation can increase knowledge, understanding, self-care, and self-regulation, and reduce blood glucose levels in DM patients [9], [10].

Nurses as health workers are also responsible as educators in the community and also caregivers in providing psychoeducation to families of DM patients [8]. Psychoeducational management in the family is an effective alternative strategy for managing care and improving the abilities of individuals and families with diabetic ulcers, so the purpose of this study was to see "How is the effectiveness of family psychoeducation therapy towards increasing family abilities in foot care in diabetic neuropathy patients in Palu City, Indonesia".

2. Method Research

2.1 Types and Research Design

The design used in this study used a Pre-Experimental research design using the One Group Pretest-Posttest design, this research design did not have a comparison group. The form of this research design is as follows in Figure 1:

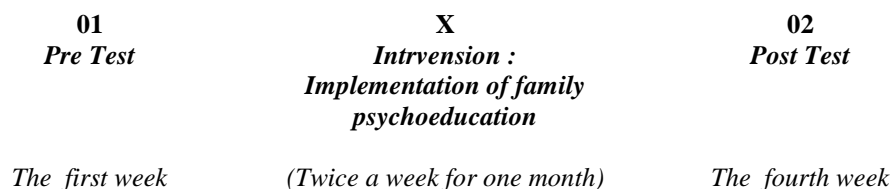


Figure 1. Form of Research Design

Description;

Pre Test: Giving a questionnaire to determine the family's ability to care for the feet of diabetic neuropathy patients.

Intervention: Implementation of family psychoeducation in foot care (twice a week) and monofilament test.

Post Test: Giving a questionnaire to find out the family's ability to care for the feet after being given psychoeducation.

The pretest was carried out in the first week of the study, namely assessing the ability of families to care for DM patients, then continued with interventions in the form of providing psychoeducation to patients and families in foot care to prevent an increase in the degree of neuropathy and prevent diabetes injuries. Intervention in the form of family psychoeducation was carried out twice a week for one month. After that, a post test was carried out to determine the effectiveness of psychoeducation by giving questionnaires and examining foot sensitivity in the last week to find out whether the family's ability to care for the feet of diabetic neuropathy patients was effective by observing changes in the level of neuropathic foot sensation in patients through the monofilament test.

2.2 Time and Location of Research

The research was carried out in the Kawatuna Health Center work area, which is one of the areas with the most cases of diabetes mellitus in the Palu City area with a total of 470 DM patients with a total of 39 visits per month during June-August 2021.

2.3 Population and Sample of Research

The population in this study were DM patients who visited the Kawatuna Health Center with an average number of visits a month of 39 people. Sampling was carried out using the probability sampling method. The purposive sampling technique to determine the sample size in this study used the formula for estimating proportions so that a total sample of 30 people was obtained according to the criteria used.

Criteria include:

1. No diabetic foot ulcer
2. The age range of respondents is >45 years
3. Long suffering from diabetes > 5 years
4. Patients with type II diabetes mellitus are willing to be respondents

2.4 Research Variables and Data Collection

In this study the variables used are:

1. Independent Variable: Family psychoeducation, namely providing information on foot care to families in caring for diabetic neuropathy patients using therapeutic communication techniques.
2. Dependent Variable: The family's ability to treatment diabetic neuropathy, namely the family's ability to care for DM patients as measured using a questionnaire and monofilament test to determine the degree of neuropathy at a certain point on the foot, with a measurement result if the monofilament test score ≤ 8 indicates mild neuropathy, a score of 9-11 indicates moderate neuropathy, and a score ≥ 12 indicates severe neuropathy.

This study used research instruments in the form of questionnaires and research observation sheets to determine the results of the monofilament test. Questionnaires were used to see differences in family abilities before and after family psychoeducation and a monofilament test was carried out to determine the level of neuropathy in DM patients. Foot sensitivity test using a monofilament test. This test consists of 10 points on each leg using a monofilament test score. If the patient feels monofilament pressure on the leg the score is 0 (zero), if the patient does not feel monofilament pressure the score is - (minus) 1 to 20.

2.5 Data Analysis

Data was collected through pre-test and post-test stages and then processed into meaningful data before being presented in the form of data analysis. Bivariate analysis in this study used the Paired Samples Test, namely to test the effectiveness of a treatment on a certain variable size. The Paired Samples Test was carried out with the help of computer software with the SPSS statistical program application.

3. Results and Discussion

3.1 Results

Characteristics of Respondents

The distribution of respondents based on characteristics is grouped according to Table 1. below:

Table 1. Characteristics of Respondents

Characteristics	(N)	(%)
Age Respondents		
46-55 years old (early elderly)	10	33.3
56-65 years old (late elderly)	9	30
> 65 Years (Elderly)	11	36.7
Total	30	100
Long Suffered		
5-7 years	13	43.3
8-10 years	9	30
>10 years	8	26.7
Total	30	100
Degree of Neuropathy Based Monofilament Test		
Before Implementation of Family Psychoeducation		
Mild neuropathy (<8)	14	46.7
Moderate neuropathy (9-11)	4	13.3
Severe neuropathy (>12)	12	40
Total	30	100
After Implementation of Family Psychoeducation		
Mild neuropathy (<8)	17	56.7
Moderate neuropathy (9-11)	12	40
Severe neuropathy (>12)	1	0.3

Total	30	100
-------	----	-----

Table 1. above showed the frequency distribution based on age, duration of DM, and degree of neuropathy. The majority of respondents were in the age group > 65 years, namely 36.7%, with a distribution based on the length of time they had DM, namely 5-7 years, namely 43.3%, and mild degree of neuropathy namely 46.7%.

Table 2. Families' Capability in Foot Care

Paired Samples Statistics				
<i>Families' Capability in Foot Care</i>	Mean	N	Std. Deviation	Sig. (2-tailed)
Before giving psychoeducation	30.30	30	1.179	.000
Week 1 of therapy	30.29	30	1.160	.000
Week 2 of therapy	64.26	30	4.313	.000
Week 3 of therapy	84.35	30	6.031	.000
Week 4 of therapy	108.4	30	5.071	.000

Based on the results of the analysis, Table 2. showed the family's ability to care for the feet of the diabetic neuropathic respondents after being given family psychoeducation for two weeks of treatment, the results are obtained with a mean value of 64.26.

Table 3. Results of the Paired Sample Correlation Test

Paired Samples Correlations			
Family Psychoeducation on Family Capabilities in Foot Care	N	Correlation	Sig.
Before and After Family Psychoeducation	30	.594	.001

Table 3. Paired Samples Correlations showed that there is an effect of implementing family psychoeducation interventions on increasing family abilities in foot care in diabetic neuropathic patients with a correlation value of > 0.594 which indicates that the two variables have a fairly strong correlation.

3.2 Discussion

The family's ability to take care of the feet after carrying out recovery measures through psychoeducational therapy is significant for the family's ability to care for the feet which is characterized by increased sensation in the feet. Family psychoeducational therapy is an alternative to health care with a focus on providing information and education through therapeutic communication [8], [11]. The following is a discussion of family abilities before and after the action of family psychoeducational therapy exercises;

1. Family ability in foot care in diabetic neuropathy patients

Based on the results of statistical tests shown in Table 2. The average family has a low ability to perform foot care for family members with a mean value of (30.30). The low ability of the family to care for the foot in diabetic neuropathy patients is indicated by the results of the monofilament test in respondents with a majority of neuropathy levels. the respondents were in the mild category 46.7% and 40% severe neuropathy. The purpose of doing a sensory examination of the feet is to determine the presence of sensory disturbances in the feet that underlie the sensory disturbances, by knowing the sensations felt by DM patients.

The results of this study showed (Table 1) the factors that influence the degree of neuropathy in DM patients. Based on the results of foot sensory examination in the category of mild degree of neuropathy, most of the respondents were aged over 46-55 years and were elderly > 65 years old (late elderly). In addition to the age factor, according to researchers, the condition of neuropathy in DM patients in this study was also influenced by the suffering of suffering from DM, which was felt by the majority of respondents 5-7 years as much as (43.3%). The length of time suffering from DM will affect the condition of blood vessels and the instability of blood sugar conditions [12].

Other studies state that the severity of diabetic neuropathy is caused by a long history of suffering from DM, hyperglycemia will be exacerbated by the duration of the disease [1]. The age factor will affect the condition of neuropathy due to prolonged hyperglycemia in DM patients [13], [14]. Hyperglycemia causes blood circulation to become obstructed so that it cannot circulate blood that carries oxygen and nutrients to all areas of the feet, causing symptoms of neuropathy in the form of reduced or lost taste sensations [12]. Complications in the form of other neurological disorders such as diabetic neuropathy that occur in diabetic patients reach 60 to 70% [1], [5], [15].

Early detection of neuropathy is very important in DM patients, because preventive interventions can be applied to reduce morbidity by identifying a decrease in protective sensation in the feet early so as to prevent diabetic injuries [11], [12]. Complementary therapy management in the form of foot care can help expedite and increase blood circulation in the feet [16], [17]. Good foot care can prevent diabetic foot complications from an early age [17], [18]. Prevention of complications of diabetes mellitus can help increase life expectancy for diabetics with peripheral sensation disorders and is effective in increasing foot sensitivity [16- 18].

2. *Family ability in foot care after family psychoeducation therapy in diabetic neuropathy patients*

Based on the results of the study in Table 3, it showed that the implementation of family psychoeducational therapy in the intervention group is significant, which means that providing family psychoeducational therapy to respondents and families with diabetic neuropathy is effective with a correlation value (0.594). The effectiveness of treatment in DM patients is marked by changes in foot sensation in which the majority of respondents experienced changes in the degree of neuropathy in the mild category (56.7%). The results of this study indicate that the role of the family in improving the function of health care by improving health status is part of family functions, one of which is by carrying out family psychoeducation therapy.

The results of this study indicate that after treating for one month, the effectiveness showed changes in the second week of implementing the foot care intervention with the mean respondent value (64.26) and a decrease in the degree of diabetic neuropathy in the intervention group. Respondents stated an increase in foot sensation with the result that 56.7% of respondents stated mild neuropathy. The researchers' assumptions increased foot care behavior in DM patients in this study; 1) the basis of family based foot care educational programs, 2) educational family methods, 3) time setting and control of nurses, 4) active involvement of respondents, 5) follow-up of public health programs.

The increase in family capacity in this study was demonstrated by the support from the family to the respondents by participating in family psychoeducational treatment measures. Preventive foot care includes washing your feet properly, drying them and oiling them. Foot care is done properly and care must be taken so that the gaps between the toes do not get wet which will cause the risk of feet becoming blisters and sores on the feet. Inspection or examination of the feet should be carried out every day to check for signs of redness, discoloration, swelling, pain or numbness and ulceration [5], [16- 18].

Below are several steps in carrying out foot care according to (5), including the following; 1) Clean your feet every day with clean water and soap, 2) Apply moisturizer/lotion to dry areas of your feet so that the skin doesn't crack, but don't get it between your toes because it will get damp and can cause fungus, 3) Clip toenails straight following the shape of a normal toe, not too close to the skin, then file so that the nails are not sharp, 4) Foot care by soaking in warm water while doing a light massage, 5) Dry feet with a clean and soft towel, 6) Apply lotion on all surfaces of the skin of the feet to avoid dry and cracked skin. Diabetic foot examination and care are all activities carried out by patients and families in preventing the occurrence of diabetic ulcers by examining and caring for the feet carried out by individuals and families who are at risk as an effort to prevent diabetic ulcers from occurring [5], [16- 18].

Improving the ability of families to care for family members who have diabetic neuropathy, the family must be physically and mentally stable and an understanding of the disease and how to care for diabetic neuropathy respondents is needed so that diabetic ulcers can be prevented [17- 19]. Psychoeducational therapy is important for families in fulfilling health information and providing education through therapeutic communication [8], [11]. Family psychoeducation is therapy given to families with a focus on providing health care information by delivering systemic and continuous health information that will reduce the burden on families when caring for clients [20], [21].

According to [20], [21] in family system theory explains that family intervention is carried out to show family dynamics so that it will reduce emotional reactions, provide support among family members and increase family interaction. DM is a chronic disease that will last a lifetime, so the role of the patient and family is very important in efforts to manage DM [19- 21]. Family support is an important factor in adherence of DM patients to treatment programs, care, activities and improvement of home care programs for patients and families [8], [19- 21].

The implications of the results of this study indicate that providing nursing actions through family psychoeducational therapy to respondents and families with diabetic neuropathy is effective in increasing the family's ability to care for feet and helping respondents obtain appropriate information in dealing with physical conditions related to chronic disease experienced by respondents by increasing the family's ability to foot care and improve sensory sensation in patients with diabetic neuropathy as well as improve the effectiveness of family member care.

4. Conclusion

Health care through the implementation of family psychoeducation to increase family capacity was effectively carried out in respondents with diabetic neuropathy in this study influenced by several predisposing factors for the occurrence of diabetic neuropathy, including age 46-65 years, and a long history of suffering from diabetes, namely 5-7 years. Implementation of family psychoeducation for respondents was effective in helping respondents obtain appropriate information in dealing with physical conditions related to chronic diseases experienced by respondents by increasing the sensation of the feet of diabetic neuropathy patients by 56.7%. Community nurses are expected to be able to provide assistance in family-based nursing actions by providing information and education through therapeutic communication, namely family psychoeducation therapy. The next researcher can examine other factors that also influence the results of this study by examining the respondent's physical activity, the respondent's perception of the disease condition, and an indepth evaluation of foot care.

5. Acknowledgment

Thank you to all respondents and their families, as well as health workers in the working area of the

Kawatuna Public Health Center and those who have helped carry out the research.

6. Ethical Clearance

The researcher uses the ethical principles of autonomy, anonymity, justice, beneficence, and non-maleficence when conducting research with a research permit based on a data collection certificate obtained from the research location in Palu City on September 1, 2021, with letter number: 465.1/139-KK/IX /2021.

7. References

[1] World Health Organization (WHO). (2019). *Global Report On Diabetes*. France: World Health Organization

[2] Lin, X., Xu, Y., Pan, X., Xu, J., Ding, Y., Sun, X., Song, X., Ren, Y., & Shan, P. F. (2020). Global, regional, and national burden and trend of diabetes in 195 countries and territories: an analysis from 1990 to 2025. *Scientific Reports*, 10(1), pp. 1–11. <https://doi.org/10.1038/s41598-020-71908-9>

[3] American Diabetes Association (ADA). (2019). *Classification and diagnosis of diabetes: Standards of medical care in diabetes 2019*. *Diabetes Care*, 42, pp.13–28. <https://doi.org/10.2337/dc19-S002>

[4] International Diabetes Federation (IDF). (2021). *International Diabetic Federation Diabetic Atlas 10th edition*.

[5] Kemenkes RI. (2019). *Suara Dunia Perangi Diabetes*. Jakarta: Kementerian Kesehatan Republik Indonesia.

[6] Riskesdas Kemenkes RI. (2018). *Riset Kesehatan Dasar (Riskesdas) Tahun 2018*. Jakarta: Kementerian Kesehatan Republik Indonesia.

[7] Documentation of PKM Kawatuna, 2022

[8] Stuart, G.W, Keliat,B.A., Pasaribu, J. (2016). *Prinsip dan Praktik Keperawatan Kesehatan Jiwa*, Edisi Indonesia. Jakarta: Elsevier

[9] Restika, I., Haskas, Y., & Dewi, I. (2019). Manajemen Pengendalian Diabetes Mellitus melalui Peningkatan Health Literacy Diabetes. *Indonesian Journal of Community Dedication*, 1(1), pp. 1–5. <https://doi.org/10.35892/community.v1i1.12>

[10] Huzaimah, N. (2018). Model Psikoedukasi untuk Meningkatkan Pemahaman dan Efikasi Diri Penderita Diabetes Mellitus Tipe 2. *Jurnal Kesehatan Wiraraja Medika*, 8(1), pp.19-26. <https://doi.org/10.24929/fik.v8i1.506>

[11] Davies M. (2019). Psychological aspects of diabetes management. *Med (United Kingdom)*;47(2), pp.131–4. <http://dx.doi.org/10.1016/j.mpmed.2014.10.003>

[12] Lewis, S. L. (2014). *Medical Surgical Nursing Assessment and Management of Clinical Problem* (9th ed). St.Louis, Missouri : Elsevier.

[13] Kusnanto, Kurnia, I. D., & Prasetya, D. I. (2015). Penerapan "Health action process approach" untuk

meningkatkan kepatuhan diet penderita DM tipe 2. *Jurnal Ners*, 10 (2), pp. 272-278.

[14] Zhao, W., Katzmarzyk, P. T., Horswell, R., Wang, Y., Johnson, J., & Hu, G. (2014). Sex differences in the risk of stroke and HbA1c among diabetic patients. *Diabetologia*, 57(5), pp. 918–926. <https://doi.org/10.1007/s00125-014-3190-3>

[15] Barbara Buchberger, Hendrik Huppertz, Laura Krabbe (2016). Symptoms of depression and anxiety in youth with type 1 diabetes: A systematic review and metaanalysis. *Elsevier Journal* (70), pp.70-84.

[16] Greenstain, B., & Wood, D. (2015). *At a Glance Sistem Endokrin* (Cetakan 2). Jakarta: Erlangga.

[17] Chatchawan, U., Eungpinichpong, W., Plandee, P., & Yamauchi, J. (2015). Effects of thai foot massage on balance performance in diabetic patients with peripheral neuropathy: a randomized parallel-controlled trial. *Medical Science Monitor Basic Research*, 21, 68–75. <https://doi.org/10.12659/MSMBR.894163>

[18] Suyanto. (2017). Pengaruh Terapi Spa Kaki Dan Senam Kaki Diabetik Pada Pasien Neuropati Perifer Deabetik. *Jurnal Keperawatan dan Pemikiran Ilmiah*, 3(4), pp. 29–37.

[19] Setyawati, A., Ngo, T., Padila, P., & Andri, J. (2020). Obesity and Heredity for Diabetes Mellitus among Elderly. *JOSING: Journal of Nursing and Health*, 1(1), 26-31. <https://doi.org/https://doi.org/10.31539/josing.v1i1.1149>

[20] Bangun, A. V., Jatnika, G., Herlina, H. (2020). Hubungan antara Dukungan Keluarga dengan Kepatuhan Diet pada Penderita Diabetes Mellitus Tipe 2. *Jurnal Ilmu Keperawatan Medikal Bedah*, 3(1), 1-76. <http://dx.doi.org/10.32584/jikmb.v3i1>

[21] Nurhikmah, L., Gayatri, D., & Nuraini, T. (2019). Body image related to quality of life diabetic ulcer patients. *Enfermeria Clinica*, July. <https://doi.org/10.1016/j.enfcli.2019.04.049>